

WHAT IS CLAIMED IS:

1. A grinding tool comprising:

a tool base having a surface set to have a first color; and

5 a plurality of abrasive grains discretely provided on the surface of the tool base and formed so that at least a surface of each abrasive grain is set to have a second color different from the first color.

2. The grinding tool according to claim 1,  
10 wherein at least one of the tool base and each of the abrasive grains is coated with a coloring agent so that the surface of the abrasive grains is colored differently from the surface of the tool base.

3. The grinding tool according to claim 1,  
15 wherein at least one of the tool base and each of the abrasive grains is mixed with a coloring additive so that the surface of the abrasive grain is colored differently from the surface of the tool base.

4. The grinding tool according to claim 1, 2, or  
20 3 wherein the color of the surfaces of the abrasive grains is set to have a density differing from that of the color of the surface of the base by a predetermined or larger amount.

5. An inspection method for inspecting conditions  
25 of a grinding surface of a grinding tool, the grinding surface comprising a surface of a tool base on which a large number of abrasive grains are discretely

formed, the inspection method comprising:

a step of setting a color difference between the surface of the tool base and a surface of each of the abrasive grains on the grinding surface;

5 a step of picking up an image of the grinding surface for which the color difference has been set, to obtain image data;

a step of subjecting the image data obtained to image processing on the basis of the color difference so as to emphasize a difference between data indicating the surface of the abrasive grains and data indicating the surface of the tool base, both data being contained in the image data; and

15 a step of outputting the image data that has been subjected to the image processing.

6. The inspection method according to claim 5, wherein the step of subjecting the image data to the image processing comprises:

20 a step of detecting a density distribution of the image data obtained;

a step of setting a binarization threshold on the basis of the detected density distribution; and

a step of binarizing the obtained image data on the basis of the set binarization threshold.

25 7. The inspection method according to claim 5, wherein the step of subjecting the image data to the image processing comprises:

a step of converting the image data on the grinding surface into digital data; and

a step of deleting lower predetermined bits from the digital image data obtained by the conversion.

5           8. The inspection method according to claim 5, further comprising:

a step of calculating numerical data indicating at least one of the distribution density of the abrasive grains and the shape and size of each of the abrasive grains on the basis of the image data that has been  
10 subjected to the image processing.

9. The inspection method according to claim 5, further comprising:

a step of comparing the calculated numerical data  
15 with thresholds preset to determine quality of the grinding surface; and

a step of outputting a result of the comparison.

10. The inspection method according to claim 5, wherein the step of setting the color difference  
20 comprises:

a step of applying a coloring agent to the grinding surface, the coloring agent having a color different from that of the surface of each abrasive grain; and

25 a step of removing only those portions of the coloring agent applied to the grinding surface which are located on the surfaces of the abrasive grains, to

expose the surfaces of the abrasive grains.

11. The inspection method according to claim 10,  
wherein the step of removing the coloring agent only  
from the surfaces of the abrasive grains comprises  
5 abutting the grinding surface to which the coloring  
agent has been applied, against a false workpiece for  
grinding work to remove the coloring agent only from  
the surfaces of the abrasive grains actually involved  
in the grinding work.

10 12. The inspection method according to claim 5,  
wherein the step of setting the color difference  
comprises:

a step of applying a coloring agent of a first  
color to the grinding surface; and

15 a step of changing a color developed by those  
portions of the coloring agent applied to the grinding  
surface which are located on the surfaces of the  
abrasive grains, to a second color.

13. An inspection apparatus for inspection  
20 conditions of a grinding surface of a grinding tool,  
the grinding surface comprising a surface of a tool  
base on which a large number of abrasive grains are  
discretely formed, the inspection apparatus comprising:

means for setting a color difference between the  
25 surface of the tool base and a surface of each of the  
abrasive grains on the grinding surface;

a camera which picks up an image of the grinding

surface for which the color difference has been set, to  
output image data obtained;

means for subjecting the image data outputted by  
the camera on the basis of the color difference so as  
5 to emphasize a difference between data indicating the  
surface of the abrasive grain and data indicating the  
surface of the tool base, both data being contained in  
the image data; and

means for outputting the image data that has been  
10 subjected to the image processing.

14. The inspection apparatus according to  
claim 13, wherein the means for subjecting the image  
data to the image processing comprises:

means for storing the image data outputted by the  
15 camera;

means for detecting a density distribution of the  
stored image data;

means for setting a binarization threshold on the  
basis of the detected density distribution; and

20 means for binarizing the stored image data on the  
basis of the set binarization threshold.

15. The inspection apparatus according to  
claim 13, wherein the means for subjecting the image  
data to the image processing comprises:

25 means for converting the image data on the  
grinding surface into digital data; and

means for deleting lower predetermined bits from

the digital image data obtained by the conversion.

16. The inspection apparatus according to claim 13, further comprising:

5 means for calculating numerical data indicating at least one of the distribution density of the abrasive grains and the shape and size of each of the abrasive grains on the basis of the image data that has been subjected to the image processing.

10 17. The inspection apparatus according to claim 16, further comprising:

means for comparing the calculated numerical data with thresholds preset to determine quality of the grinding surface; and

means for outputting a result of the comparison.

15 18. The inspection method according to claim 13, wherein the means for setting the color difference comprises:

20 means for applying a coloring agent to the grinding surface, the coloring agent having a color different from that of the surface of each abrasive grains; and

25 means for removing only those portions of the coloring agent applied to the grinding surface which are located on the surfaces of the abrasive grains, to expose the surfaces of the abrasive grains.

19. The inspection apparatus according to claim 13, wherein the means for removing the coloring

agent only from the surfaces of the abrasive grains  
comprises abutting the grinding surface to which the  
coloring agent has been applied, against a false  
workpiece for grinding work to remove the coloring  
agent only from the surfaces of the abrasive grains  
actually involved in the grinding work.

20. The inspection apparatus according to  
claim 13, wherein the means for setting the color  
difference comprises:

means for applying a coloring agent of a first  
color to the grinding surface; and

means for changing a color developed by those  
portions of the coloring agent applied to the grinding  
surface which are located on the surfaces of the  
abrasive grains, to a second color.